PLANT AND SOIL

International Journal of Plant Nutrition, Plant Chemistry, Soil Microbiology and Soil-borne Plant Diseases.

Revue internationale de nutrition des plantes, de chimie végétale, de microbiologie du sol et des maladies des plantes en rapport avec le sol.

Internationale Zeitschrift für Pflanzenernährung, Pflanzenchemie, Bodenmikrobiologie und bodenbedingte Pflanzenkrankheiten.

Issued under the auspices of the

"Koninklijk Genootschap voor Landbouwwetenschap"

(*Royal Netherlands Society of Agricultural Science*)

Executive Editors: D. I. Arnon, Berkeley; J. Baeyens, Louvain; E. G. Mulder, Wageningen; F. Steenbjerg, Copenhagen; L. K. Wiersum, Haren.

Secretary: G. H. Arnold, Institute for Soil Fertility, Haren (Gr.), Netherlands.

Assistant Secretaries: J. K. Smit, Epe, and A. Houwers, Wageningen.

Consulting Editors; R. Brouwer, Utrecht; A. van Diest, Wageningen; W. Dijkshoorn, Wageningen; H. de Haan, Oosterzee; W. R. C. Handley, Oxford; J. L. Harley, Oxford; H. ten Have, Wageningen J. den Holder, Ghent; S. Larsen, Copenhagen; J. Lavollay, Paris; L. Leyton, Oxford; T. A. Lie, Wageningen; W. J. Lütjeharms, Bloemfontein; E. Melin, Uppsala; M. Ødelien, Ås; C. S. Piper, Adelaide; K. W. Smilde, Haren; D. Snow, Reading; H. G. Thornton, Harpenden, Herts.; F. W. Went, Reno.

The Editors are also advised by experts from the Staffs of the Institute for Soil Fertility, Haren and of the Department of Microbiology, Agricultural University, Wageningen.

Druk: Koninklijke Drukkerij Van de Garde N.V., Zaltbommel

Plant and Soil

INTERNATIONAL JOURNAL OF PLANT NUTRITION,
PLANT CHEMISTRY, SOIL MICROBIOLOGY AND
SOIL-BORNE PLANT DISEASES

VOLUME 43

Per.
SB13
P53

THE HAGUE
MARTINUS NIJHOFF
1975

© 1975 by Martinus Nijhoff, The Hague, Netherlands
All rights reserved, including the right to translate or to reproduce this journal or parts thereof in any form

PRINTED IN THE NETHERLANDS

CONTENTS — TABLE DES MATIÈRES — INHALT

PAGE

Z. Adamczyk-Winiarska, M. Król and J. Kobus, Microbial oxidation of elemental sulphur in brown soil. 95

M. I. H. Aleem, Biochemical reaction mechanisms in sulfur oxidation by chemosynthetic bacteria 587

Hussain A. Al-Saadi and Herman H. Wiebe, The influence of maturity, season and part of plant on matric bound water 371

Tamara E. Awerbuch, The utilization of phosphate in tomato plants at different growth stages. 443

A. Ayanaba and A. P. O. Omayuli, *Short communication*. Microbial ecology of acid tropical soils – A preliminary report 519

Rosario Azcon and J. M. Barea, Synthesis of auxins, gibberellins and cytokinins by *Azotobacter vinelandii* and *Azotobacter beijerinckii* related to effects produced on tomato plants 609

Jean-René Bailly et Véronique Nkundikije-Desseaux, Sur la formation de substances noires à partir de phénols simples par des microorganismes de sol 235

K. A. Balasubramanian, Pattern of distribution of certain cations in downy mildew-affected sorghum and soil. . . . 621

K. K. R. Bhardwaj, Survival and symbiotic characteristics of Rhizobium in saline-alkali soils. 377

Susan H. Bicknell and William H. Smith, *Short communication*. Influence of soil salt, at levels characteristic of some roadside environments, on the germination of certain tree seeds. 719

F. H. Braekke and T. T. Kozlowski, Shrinkage and swelling of stems of *Pinus resinosa* and *Betula papyrifera* in northern Wisconsin. 387

DOUGLAS E. CALDWELL, SARAH J. CALDWELL and JAMES M. TIEDJE, An ecological study of the sulfur-oxidizing bacteria from the littoral zone of a Michigan lake and a sulfur spring in Florida 101

TH. E. CAPPENBERG, Relationships between sulfate-reducing and methane-producing bacteria 125

F. B. DAZZO and D. H. HUBBELL, *Short communication.* Concanavalin A: Lack of correlation between binding to Rhizobium and specifity in the Rhiozobium-legume symbiosos . 713

K. S. DHILLON, M. K. SINHA and N. S. RANDHAWA, Organometallic phosphates V. Complexation of zinc and phosphorus by humic compounds 317

A. W. S. M. VAN EGERAAT, *Short communication.* Ninhydrin-positive compounds present in seedling roots of leguminous plants 503

BIRGITTA ENGLUND, Potential nitrogen fixation by blue-green algae in some Tunesian and Swedish soils 419

MAURICE FRIED and HANS BROESHART, *Short communication.* An independent measurement of the amount of nitrogen fixed by a legume crop 707

J. LE GALL, Bactéries sulfato-réductrices: Enzymologie de la réduction dissimilative des sulfates 115

SUBRATA GHOSHAL, Biological immobilization and chemical fixation of native and fertilizer phosphorus in soil 649

VAGNER HAAHR, *Short communication.* Comparison of manual and automatic irrigation of pot experiments 497

T. A. HANSEN, A. B. J. SEPERS and H. VAN GEMERDEN, A new purple bacterium that oxidizes sulfide to extracellular sulfur and sulfate 17

FUAD HASHWA, Thiosulfate metabolism in some red phototrophic bactera 41

D. S. Hayman, A. M. Johnson and I. Ruddlesdin, The influence of phosphate and crop species on Endogone spores and vesicular-arbuscular mycorrhiza under field conditions 489

M. D. Idris, M. M. Hossain and F. A. Choudhury, *Short communication*. The effect of silicon on lodging of rice in presence of added nitrogen 691

M. Jalaluddin, Study of micro-organisms from root regions of rice 337

C. Jeanson, Présence de soufre dans des agrégats construits par des forficules. Microstructures et composition élémentaire 219

Kiran Johri, B. N. Johri and S. B. Saksena, Colonization capacity of the soil micro-organisms in relation to fungistasis 347

E. T. Kanemasu, D. L. Bark and E. Chin Choy, Effect of soil temperature on sorghum emergence 411

S. Kar and B. P. Ghildyal, Rice root growth in relation to size, quantity, and rigidity of pores 627

D. P. Kelly and O. H. Tuovinen, Metabolism of inorganic sulphur compounds by *Thiobacillus ferrooxidans* and some comparative studies on *Thiobacillus A2* and *T. neapolitanus* 77

B. Khosrovi and J. D. A. Miller, A comparison of the growth of *Desulfovibrio vulgaris* under a hydrogen and under an inert atmosphere 171

J. Gijs Kuenen, Colourless sulfur bacteria and their role in the sulfur cycle 49

H. Marschner and D. A. Barber, *Short communication*. Iron uptake by sunflower plants under sterile and non-sterile conditions. 515

D. J. Mead and W. L. Pritchett, Fertilizer movement in a slash pine ecosystem. I. Uptake of N and P and N movement in the soil. 451

D. J. Mead and W. L. Pritchett, Fertilizer movement in a slash pine ecosystem. II. N distribution after two growing seasons. 467

J. T. Moraghan and O. A. Porter, Maize growth as affected by root temperature and form of nitrogen. 479

Jorma K. Miettinen, Artturi Ilmari Virtanen. 229

S. Miyamoto, R. J. Prather and J. L. Stroehlein, Sulfuric acid and leaching requirements for reclaiming sodium-affected calcareous soils. 573

B. R. Nagar, E. S. Waight, H. L. C. Meuzelaar and P. G. Kistemaker, *Short communication*. Studies on the structure and origin of soil humic acids by Curie point pyrolysis in direct combination with low-voltage mass spectrometry. . 681

L. F. Oltmann, E. G. van der Beek and A. H. Stouthamer, Reduction of inorganic sulphur compounds by facultatively aerobic bacteria 153

A. R. Overman, Ion transport through sand by convective diffusion 663

Tang Van Hai et Truong Minh Hung, Cinétique et électrocinétique de l'absorption du 2.4-D et 2.4.5-T par les plantes intactes de riz 671

K. V. Paliwal, G. L. Maliwal and G. C. Nanawati, Effect of bicarbonaterich irrigation waters on the growth, nutrient uptake and synthesis of proteins and carbohydrates in wheat 523

Norbert Pfennig, The phototrophic bacteria and their role in the sulfur cycle 1

J. N. Rai and V. C. Saxena, *Short communication*. Sclerotial mycoflora and its role in natural biological control of 'white-rot' desease 509

M. S. Saimbhi, S. K. Arora and I. M. Chhibba, *Short communication*. Influence of seed treatment with 2-chloroethylphosphonic acid, gibberellic acid, ascorbic acid, and simazine on growth and nutrient composition of pea (*Pisum sativum* L.) seedlings 697

R. L. Salsbury and D. L. Merricks, Production of methanethiol and dimethyl sulfide by rumen micro-organisms . . 191

R. C. Sharma, J. S. Grewal, K. C. Sud and S. S. Saini, *Short communication.* Effects of biuret content in urea and nitrogen source on the yield and composition of potato tubers 701

M. K. Sinha, Effect of straw application on yield and phosphorus nutrition of crops 537

R. Snehi Dwivedi, N. S. Randhawa and R. L. Bansal, Phosphorus-zinc interaction. I. Sites of immobilization of zinc in maize at a high level of phosphorus 639

J. H. Stern, J. W. White, R. L. Cunningham and R. H. Cole, Relationship among irrigation-media regimes and plant growth 433

R. J. Stevens and I. S. Conforth, An all-glass closed-system soil percolation apparatus for gas and liquid. 327

P. Subrahmanyam and C. S. Prabhakar, *Short communication.* Mobilization and exudation of photo-assimilated ^{14}C by developing pods of groundnut (*Arachis hypogaea* L.) . . 687

P. Tiano, R. Bianchi, G. Gargani and S. Vannucci, Research on the presence of sulphur-cycle bacteria in the stone historical buildings in Florence. 211

Bansi L. Tiku, Ecophysiological aspects of halophyte zonation in saline sloughs 355

Hans G. Trüper, The enzymology of sulfur metabolism in phototrophic bacteria – A review 29

V. Vančura and M. Staněk, Root exudates of plants. V. Kinetics of exudates from bean roots as related to the presence of reserve compounds in cotyledons 547

J. H. Vosjan, Respiration and fermentation of the sulphate-reducing bacterium *Desulfovibrio desulfuricans*, in a continuous culture 141

M. Wainwright and G. J. F. Pugh, Effect of fungicides on the numbers of micro-organisms and frequency of cellulolytic fungi in soils 561

K. C. Willson, E. Hainsworth, M. J. Green and P. B. T. O'Shea, Studies on the mineral nutrition of tea. III. Phosphate. 259

K. C. Willson, Studies on the mineral nutrition of tea. IV. Potassium 279

K. C. Willson, Studies on the mineral nutrition of tea. V. Calcium 295

K. C. Willson, Studies on the mineral nutrition of tea. VI. Magnesium 309